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Captain Hooper urges the enforcement of more stringent regulations respecting sea-otter hunting, not only for the purpose of preserving "the most beautiful and valuable fur-bearing animal in the world, but to preserve it for the benefit of the natives who have been dependent upon it for more than a century, and who will be reduced to suffering and want without it."

J. A. ALLEN.

Pacific Coast Annelids. — In the recent paper[1] by Prof. H. P. Johnson, of the University of California, we have the promise of an extension of our knowledge of the marine annelids of the western coast of North America that will undoubtedly be welcomed by students of marine zoology. This first contribution deals only with five families of the order Polychæta, *viz.*, the Euphrosynidæ, the Amphinomidæ, the Palmyridæ, the Polynoidæ, and the Sigalionidæ. The scope of the work which Dr. Johnson has laid out for himself, and the beginning of the execution of which is now presented, may be stated in his own words: "It is certainly an interesting reflection of the haphazard nature of zoological exploration to find that much more is known about the Polychæta in the most remote regions of the earth, in the farthest north and the farthest south, in the East Indies and in the South Seas, than along the easily accessible shores of a great civilized nation. No apology, therefore, need be offered for the preponderance of attention here given to such preliminary matters as descriptions of new species, distribution, habits, and other details of the natural history of the group. It is the writer's intention to present the entire order Polychæta as represented on our shores thus in outline, and concurrently or subsequently to fill in the picture with as much of embryological and histological detail as possible. The present publication is in every sense a *prodromus* of a more extensive work, which will require many years to complete."

Eighteen species in all are treated in the paper, thirteen of which are new to science. They are as follows:

Euphrosynidæ: *Euphrosyne aurantiaca*, sp. nov., *Euphrosyne arctia*, sp. nov.; Amphinomidæ: *Eurythoë californica*, sp. nov.; Palmyridæ: *Chrysopetalum occidentale*, sp. nov., HETEROPALE, gen. nov., *Heteropale bellis*, sp. nov.; Polynoidæ: POLYNOË Savigny (Sens. ext.) (including *Lepidonotus* Leach, *Polynoë* Savigny, and *Halosydna* Kinberg), *Polynoë squamata* (L.) Aud. et M.-Edw., *Polynoë brevisetosa* Kinberg, *Polynoë*

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[1] Johnson, H. P. A Preliminary Account of the Marine Annelids of the Pacific Coast, with Descriptions of New Species. *Proc. Calif. Acad. Sci.*, Ser. 3, zool., vol. i, No. 5, 1897, pp. 153–190, Pls. V–X.

reticulata, sp. nov., *Polynoë gigas*, sp. nov., *Polynoë lordi* Baird, *Polynoë pulchra*, sp. nov., *Polynoë fragilis* Baird; HARMOTHOË Kinberg (Sens. ext.) (including *Antinoë*, *Harmothoë*, *Hermadion*, Kinberg; *Eucrante*, *Eunoa*, *Evarne*, *Lænilla*, *Lagisca*, *Melænis*, *Nychia*, Malmgren; *Polyeunoa* M'Intosh): *Harmothoë imbricata* (L.) Malmgren, *Harmothoë hirsuta*, sp. nov., *Harmothoë crassicirrata*, sp. nov.; Sigalionidæ: PEISIDICE, gen. nov., *Peisidice aspera*, sp. nov., *Sthenelais fusca*, sp. nov., *Sthenelais verruculosa*, sp. nov.

Concerning the classification of the polynoids, the author tells us that he has been strongly tempted to follow the more conservative students of the group and place the forms he has studied all under the type genus Polynoë; but that, after a careful study of the material at hand and the literature available, he has become convinced of the practicability of arranging nearly all the known species under two genera, *viz.*, *Polynoë* Savigny and *Harmothoë* Kinberg. He wishes it to be fully understood, however, that he regards this as provisional only.

Collections have been made at numerous points, from San Diego on the south to Puget Sound on the north. Most of the species have been collected by the author himself, and have been studied in the living condition.

Numerous interesting observations on the habits and variability of several of the species are recorded, none of which are more interesting, perhaps, than those pertaining to the commensalism exhibited by some of the species of the genus Polynoë. Thus we are told concerning *P. brevisetosa* that "probably no species of this great family, noted for the morphologic plasticity of many of its members, is more variable than this. The variation it exhibits is unquestionably due to differences in its environment." Some of the individuals are free living, while others are commensal in the tubes of species of Amphitrite and Thelepus. "Like another tube-commensal of our coast, *Polynoë reticulata*, it attains a larger size in this mode of existence than when free living, but not unless it lives in a tube of liberal dimensions, so that both the rightful occupant and its messmate have ample space." The commensal individuals are said to be proportionally longer and narrower than the free-living ones, and furthermore to exhibit certain structural peculiarities, most of which appear to be the direct result of their mode of life. The elytra are thinner and smoother, and not so likely to extend to the extreme posterior end of the body. And, what is still more significant, the elytra of the ventral series tend to develop a strong upper bristle, which the author thinks is of advantage in crawling into the tube. A very curious thing in connection with the commensals of this species is the fact that the pigment is heavier and more uniformly distributed in them than in the free-living individuals. In another species, however, *viz.*, *P. pulchra*, which lives "as a common messmate (or possibly parasite) of two animals wide apart in the organic scale, *Holothuria californica* and *Lucapina crenulata*," the wholly hidden specimens may be destitute of pigment.

Polynoë gigas the author finds to be almost always asymmetrical in the arrangement of the elytra and dorsal cirri. Of nine specimens examined, only three had the same number of elytra on each side; and of these three, only one was fully symmetrical. W. E. R.

Regeneration of the Earthworm's Head. — Of late there has been a noticeable revival of the old interest in problems of regeneration of lost parts in animals, but it has been rather striking that so many observers have been content to use only the old methods available before the present era of microtome and perfected staining technique. In contrast to them comes the second part of the investigations of Dr. K. Heschler,[1] who studies by serial sections the newly forming heads in nearly one hundred earthworms from which the first four or five segments had been cut off.

Some of the results obtained are briefly noted below, but it should be kept in mind that the author does not claim to have exhausted the most difficult question of the histology of regenerating organs in the earthworm, and that he freely concedes that the interpretation of the confused and complex masses of tissue we find in these regenerating heads has a large subjective element.

During the first week after the removal of the head there is but little actual regeneration of parts. The wound heals by the formation of a cicatrix that is made up chiefly of lymph cells; but after a few hours spindle-shaped cells of undetermined origin are added to it. The epidermis grows over this cicatrix in a few days, while the intestine closes up and draws back so that the cicatricial tissue lies between its blind end and the new epidermis.

After this first period there is active regeneration accompanied by mitotic cell division. New cells — "regeneration cells" — wander into the cicatrix from epidermis, muscle, and other sources. In the complex mass so formed the new nervous and digestive organs of the head now arise.

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[1] Ueber Regenerationsvorgänge bei Lumbriciden, II. *Jenaische Zeit. f. Naturwissenschaft.* März, 1898. Pls. XXI–XXVI, pp. 521–596.